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Modeling of supernova-relevant hydrodynamic instability experiments on the Nova laser,* J. Kane,¹ S.G. Glendinning,² M. Wood-Vasey,³ B.A. Remington,² D. Arnett,¹ A. Rubenchik,⁴ E.P. Liang,⁶ R. London,² and J. Castor,² ¹University of Arizona, ²Lawrence Livermore National Laboratory, ³Harvey Mudd College, ⁴University of California-Davis, and ⁶Rice University.

Supernova 1987A focused attention on the critical role of hydrodynamic instabilities in the evolution of supernovae. On quite a separate front, the detrimental effect of hydrodynamic instabilities in inertial confinement fusion (ICF) has long been known. Tools from both areas are being tested on a common project. At Lawrence Livermore National Laboratory, the Nova Laser is being used in scaled laboratory experiments of hydrodynamic mixing under supernova-relevant conditions. Numerical simulations of the experiments are being done, using hydrodynamics codes at the Laboratory, and astrophysical codes successfully used to model the hydrodynamics of supernovae and their interaction with the environment. The results of the simulations will be presented and compared with experiment. Possible implications for interpreting supernova observations and for supernova modeling will be discussed. *Work performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under contract number W-7405-ENG-48.